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ABSTRACT

This minireport deals specifically with one classroom environment variable, the physical structure of the classroom as an open-space or a self-contained room. The data for the analyses were drawn from 190 primary grade classes (grades 1-6) and 182 intermediate grade classes (grades 4-6). Classes were analyzed as units, using class means. A total of 29 variables were involved in the multiple regression analyses in order to determine what variables relate significantly to classroom structure. A series of analyses of covariance were run, using the posttest reading and mathematics scores as the dependent variables and the corresponding pretest scores as the covariants with classroom structure (open-space or self-contained) as the independent variable. Results indicated that there are significant reading test differences between the two classroom structures in the primary grades. Reading achievement gains in self-contained classrooms were significantly greater than those in the open-space classrooms. For the intermediate grades it appears that the self-contained classroom provides a better learning environment than does the open-space classroom. The students read more on their own, need less extra help but receive more, are more frequently referred when they have reading or math problems, and present less behavior problems for teachers. At the same time, the open-space classroom is associated with higher interest in reading. (Author/MLF)

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DISTRICT OF COLUMBIA PUBLIC SCHOOLS

OPEN-SPACE VS. SELF-CONTAINED CLASSROOMS: DIFFERENTIATIONS AND CONTRIBUTING VARIABLES

(1977-78) Grades One-Six

Evaluation System Mini-Report Six

Division of Research and Evaluation
Office of Educational Accountability
March 1980

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Preface

This is one of a series of mini-reports of the Evaluation System. The Evaluation System publishes a major report of evaluations and findings for each year of data collected. It also does a variety of background analyses and special studies of the data. Those analyses and studies are of specific technical and practical questions and issues. Whenever an analysis or a study of general interest has been completed, the Evaluation System will make the results available in this mini-report form.

Mini-reports are intended to be brief and non-technical. When they deal with technical material, the supporting analyses can be obtained from the Division of Research and Evaluation. In general, a formal technical report containing full documentation and data for the mini-series will be published periodically.

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INTRODUCTION

The Evaluation System has thus far focused primarily on reading achievement gain and, more recently, on mathematics achievement gain, in an effort to determine what variables contribute significantly to gain. This mini-report deals specifically with one classroom environment variable the physical structure of the classroom, in terms of whether it is an open-space or a self-contained room.

The Data Base

Data for the present analyses were drawn from the 1977-78 Evaluation System Data Base. The total pool of classes in the 34 elementary schools in the Evaluation System in 1977-78 was 548. For purposes of the analyses reported here, the usable sample of classes across all six grades was 372. Of these, 190 were primary grade classes (grades 1-3) and 182 were intermediate grade classes (grades 4-6). A full description of the data base and statistical approaches is available in the Evaluation System Report: Evaluation of Outcomes 1977-78: An Evaluation System Report on Reading Programs and Reading Achievement Part II-A Technical Report, dated November 1979.

Variables

A total of 29 variables were involved in the regression analyses reported here. Briefly, the variables were:

1. Classroom structure: open space vs. self contained
2. PRT Pretest score
3. Grade
4. Number of PRT test levels
5. Class size
6. Class absence rate
7. Percentage of male students
8. Class holding rate
9. Teacher turnover rate
10. Teacher absence rate
11. Percentage of students receiving free lunch
12. Average reading material level
13. Average amount of reading on own

14. Average interest in reading

15. Mean deviation in reading class

16. Average need for extra help in reading

17. Percent receiving extra help in reading

18. Presence of math specialist

19. Learning problem - reading

20. Learning problem - mathematics

21. Learning barrier - behavior

22. Learning barrier - economic conditions

23. Learning problem - health

24. Reading material level - standard deviation

25. Percent referred to special teachers

26. Teaching situation - departmentalized

27. Teaching situation - multi-age

28. Teaching situation - multi-level

A majority of these variables have been employed in previously reported analyses of PRT reading data and PMT mathematics data.

RESULTS

As in earlier analyses of reading and mathematics achievement gain, classes were analyzed as units, using class means. In preparing the present report, both analyses of covariance and multiple regression analyses were run.

The significance of the socioeconomic level indicator (percent of free lunch) variable as a predictor raised a question as to whether certain schools of a higher socioeconomic level may have biased the sample. Six such schools were identified. These schools located in the far northwest section of the city were unique in that there were few if any students reported as receiving free lunch. Additionally, there were no open-space classroom structures (1977-78) in either of the six schools nor in any public school located in that particular area of the city. Therefore, the analyses of covariance and the regression analyses were rerun excluding these schools. The second set of analyses without the identified high socioeconomic level schools did not change the findings which are reported here.

Test Score Differences

A series of analyses of covariance were run, using the posttest reading and mathematics scores as the dependent variables and the corresponding pretest scores as the covariants with classroom structure (open-space or self-contained) as the independent variable. Results indicated that there are significant reading test differences between the two classroom structures in the primary grades. Reading achievement gains in self-contained classrooms were significantly greater than those in the open-space classrooms.

Factors Relating to Classroom Structure Differentiation: Primary Grades

A regression analysis of primary grade data was undertaken in order to determine what variables relate significantly to classroom structure. The analyses are similar in form to those reported in the series of summary and technical reports covering data for the 1975-76, 1976-77, and 1977-78 school years. For present purposes, the criterion variable was classroom structure, and the differentiation was between those classes held in open-space rooms and those held in self-contained rooms. The remaining 28 variables contained in the foregoing list were entered into the regressions as predictor variables.

Results of the analysis of primary grade data showed that a total of eight variables were significantly predictive of the differentiation between open-space and self-contained classrooms. The eight significant predictor variables were:

1. Class absence rate. Results show the presence of a significantly higher class absence rate in open-space classrooms than in self-contained classrooms.

2. Class holding rate. The holding rate is higher (i.e., the student turnover rate is lower) in open-space than in self-contained classes.

3. Teacher absence rate. The teacher absence rate is higher in open-space classrooms than in self-contained classrooms.

4. Socioeconomic level. Data indicates that the socioeconomic level is somewhat higher in self-contained classrooms. The percentage of students in a given classroom receiving free lunch was the indicator of socioeconomic level.

5. Percent receiving extra help in reading. A higher percentage of students in self-contained than in open-space classrooms receive extra help in reading from sources other than the classroom teacher.

6. Multi-age teaching situation. Results show that the multi-age teaching situation is more likely to be present in open-space classrooms.

7. Multi-level teaching situation. Multi-level teaching situations are also more likely to be present in open-space classrooms.

8. Team teaching situation. Results show that more team teaching takes place in open-space classroom settings than in those involving self-contained classrooms.

Implications for the Primary Grades

Causal relationships cannot be definitively determined from the data available for the present study. However, it is clear that classroom structure in the primary grades is significantly related to a number of other variables that characterize classes, teachers, and teaching situations at this level. To what extent these relationships are caused by the classroom structure and to what extent these factors contribute to the lower achievement gains found in open-space classrooms have not been determined. It can be noted, however, that open-space classrooms, where reading achievement gains are lower, are characterized by higher absence rates for both teachers and students and by a lower socioeconomic level. In addition, students in these classrooms receive less extra help in reading.

Factors Relating to Classroom Structure Differentiation: Intermediate Grades

The data for intermediate grade classes were subjected to a regression analysis parallelling that reported for the primary grades. Again, the criterion variable was classroom structure, and the predictors were the same 28 listed. A total of 11 predictor variables were significant. The significant predictors were:

1. Amount of self-initiated reading. Results indicate that students in self-contained classrooms do more reading on their own than do those in open-space classrooms.

2. Average interest in reading. Results show that, although they read less on their own, students in open-space classrooms actually show higher interest in reading than those in self-contained classrooms. Taken together these two variables may suggest the need to reexamine teaching practices in open-space classrooms. It could be that while such open-space situations may contribute to higher interest in reading students do not then have the opportunity or are not encouraged to read on their own in order to fulfill this interest.

3. Average need for extra help. Results of teacher ratings show that more students in open-space classrooms than in self-contained classrooms need extra help in reading.

4. Percent receiving extra help in reading. Despite the fact that students in open-space situations need more extra help a higher percentage of students in self-contained classrooms actually receive extra help in reading from sources other than the classroom teacher.

5. Learning problem-reading. Data indicate that more students are referred because of learning problems in reading in self-contained classrooms than in open-space classrooms.

6. Learning problem-mathematics. More students are referred because of learning problems in mathematics in self-contained classrooms than are referred in open-space classrooms.

7. Learning barrier-behavior. Data for the behavior barrier variable suggest that there are more students referred for behavior reasons in open-space classrooms than in self-contained classrooms.

8. Learning barrier-economic condition. There are also more students referred for reasons of economic conditions by teachers in open-space than self-contained classrooms.

9. Teaching situation-multi-age. The multi-age teaching situation is seen more frequently in open-space classrooms.

10. Teaching situation-multi-level. There are also more multi-level situations found in open-space classrooms.

11. Teaching situation - team teaching. There is a proportionally greater amount of team teaching done in connection with open-space than with self-contained classrooms. It should be noted that the last three variables mentioned, all teaching situation variables, were also significant predictors in the primary grades.

Implications for the Intermediate Grades

It appears that the self-contained classroom provides a better learning environment than does the open-space classroom. The students read more on their own, need less extra help but receive more, are more frequently referred when they have reading or math problems, and present less behavior problems for teachers. At the same time, the open-space classroom is associated with higher interest in reading. If the elements of open-space classroom teaching that generate higher reading interest could be determined, these aspects of the open-space situation could possibly be incorporated in the self-contained teaching situation providing an overall better learning environment for students.

CONCLUSIONS

A comparison of results for the primary and intermediate grades shows some overlap in the predictors which relate significantly to reading achievement, but also show some interesting differences. Basically, the data indicate that at both grade levels the teaching situation variables all associate significantly with classroom structure. Multi-age, multi-level, and team teaching situations are all proportionally more common in open-space than in self-contained classrooms. In addition, students in open-space rooms receive less extra help in reading. Other variables contributing significantly in the regressions are different at the primary and the intermediate levels. In both cases, however, results seem to favor the self-contained classroom. At the primary level, it is characterized by lower rates of class and teacher absence and a higher mean socioeconomic level. At the intermediate level the self-contained classroom is associated with greater amounts of self-initiated reading, less need for extra help in reading, and more referrals in both math and reading for those students who experience learning problems. In addition, there are less referrals for behavior problems in self-contained classrooms.